

HIGH COLLECTOR TO EMITTER VOLTAGE 4 PIN ULTRA SMALL FLAT LEAD OPTOCOUPLER

PS2932-1
PS2933-1

FEATURES

- **ULTRA SMALL FLAT LEAD PACKAGE:**
4.6 (L) x 2.5 (W) x 2.1 (H) mm
- **ISOLATION DISTANCE:**
0.4 mm MIN
- **HIGH COLLECTOR TO EMITTER VOLTAGE:**
V_{CEO} = 300 V: PS2932-1
V_{CEO} = 350 V: PS2933-1
- **HIGH ISOLATION VOLTAGE**
BV = 2500 V_{r.m.s.}
- **AVAILABLE ON TAPE AND REEL:**
PS2932-1-F3, F4: 3500 pcs/reel
PS2933-1-F3, F4: 3500 pcs/reel

DESCRIPTION

The PS2932-1 and PS2933-1 are optically coupled isolators containing a GaAs light emitting diode and an NPN silicon phototransistor in one package for high density mounting applications. This device is housed in an ultra-small flat-lead package which realizes a reduction in mounting area of about 30% compared to the PS28xx series.

APPLICATIONS

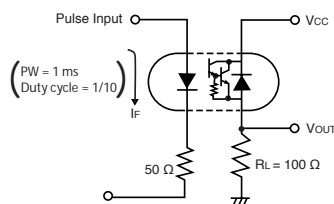
- HYBRID IC
- TELEPHONE, EXCHANGE EQUIPMENT, FAX

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER			PS2932-1, PS2933-1		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
Diode	V _F	Forward Voltage, I _F = 1 mA	V	0.9	1.3
	I _R	Reverse Current, V _R = 5 V	μA		5
	C _T	Terminal Capacitance, V = 0 V, f = 1.0 MHz	pF		15
Transistor	I _{CEO}	Collector to Emitter Current, V _{CE} = 300 V (350 V) ¹	nA		400
Coupled	CTR	Current Transfer Ratio (I _C /I _F), I _F = 1 mA, V _{CE} = 2 V	%	400	4500
	V _{CE(sat)}	Collector Saturation Voltage, I _F = 1 mA, I _C = 2 mA	V		1
	R _{I-O}	Isolation Resistance, V _{I-O} = 1.0 kVdc	Ω	10 ¹¹	
	C _{I-O}	Isolation Capacitance, V = 0 V, f = 1.0 MHz	pF		0.4
	t _r	Rise Time ²	V _{CC} = 5 V, I _C = 10 mA, R _L = 100 Ω	μs	20
t _f	Fall Time ²	μs		5	

Notes

1. I_{CEO} condition : PS2932-1: V_{CE} = 300 V:
PS2933-1: V_{CE} = 350 V:
2. Test circuit for switching time:



ABSOLUTE MAXIMUM RATINGS¹

(TA = 25°C unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
Diode			
IF	Forward Current (DC)	mA	50
ΔIF/°C	Forward Current Derating	mA/°C	0.5
IF (Peak)	Peak Forward Current ²	A	0.5
PD	Power Dissipation	mW	60
VR	Reverse Voltage	V	6
Transistor			
VCEO	Collector to Emitter Voltage	V	300
	PS2932-1		350
VECO	Emitter to Collector Voltage	V	0.3
IC	Collector Current	mA	60
PC	Power Dissipation	mW	120
ΔPC/°C	Power Dissipation Derating	mW/°C	1.2
Coupled			
VISO	Isolation Voltage ³	V _{r.m.s.}	2500
PT	Total Power Dissipation	mW	160
TA	Operating Ambient Temp.	°C	-55 to +100
TSTG	Storage Temperature	°C	-55 to +150

Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. PW = 100 μs, Duty Cycle = 1%.
3. AC voltage for 1 minute at TA = 25°C, RH = 60 % between input and output.

CAUTIONS REGARDING NOISE:

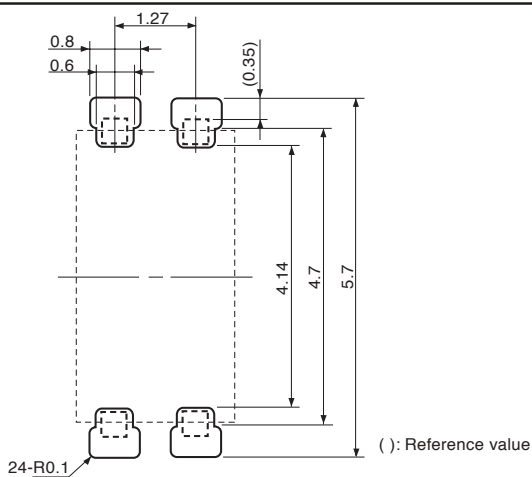
Be aware that when voltage is applied suddenly between the optocoupler's input and output or between collector-emitters at startup, the output side may enter the on state, even if the voltage is within the absolute maximum ratings.

ORDERING INFORMATION

PART NUMBER	PACKING STYLE
PS29132-1-F3	Embossed Tape 3500 pcs/reel
PS2932-1-F4	
PS29133-1-F3	
PS29133-1-F4	

RECOMMENDED

MOUNT PAD DIMENSIONS (Units in mm)



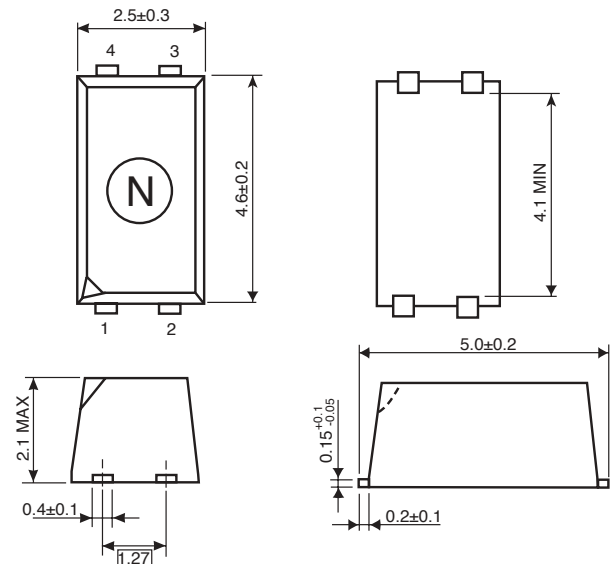
Remark:

This drawing is considered to meet air and outer creepage distance 4.0 mm minimum. All simensions in this figure must be evaluated before use.

OPTOCOUPLER CONSTRUCTION

PARAMETER	UNIT (MIN)
Air Distance	4 mm
Creepage Distance	4 mm
Isolation Distance	0.4 mm

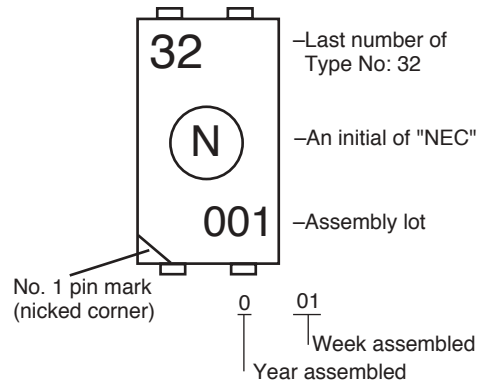
OUTLINE DIMENSIONS (Units in mm)



TOP VIEW

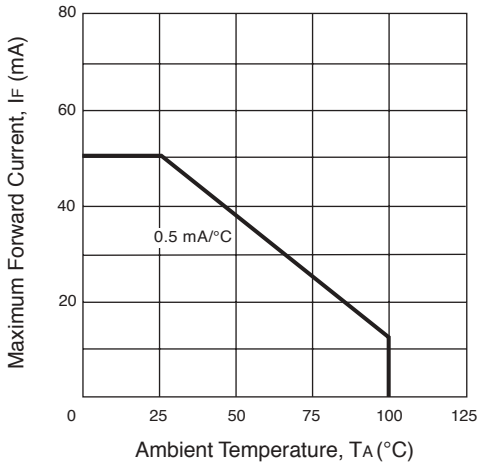
1. Anode
2. Cathode
3. Emitter
4. Collector

MARKING

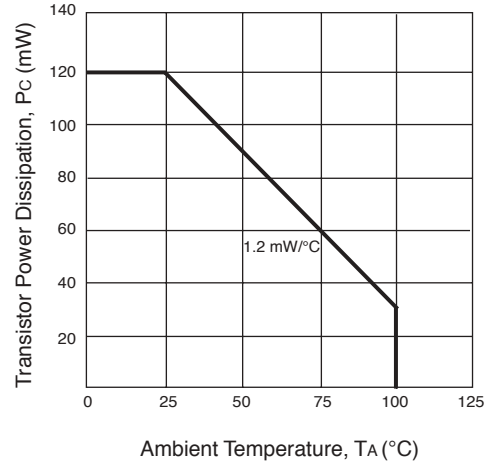


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

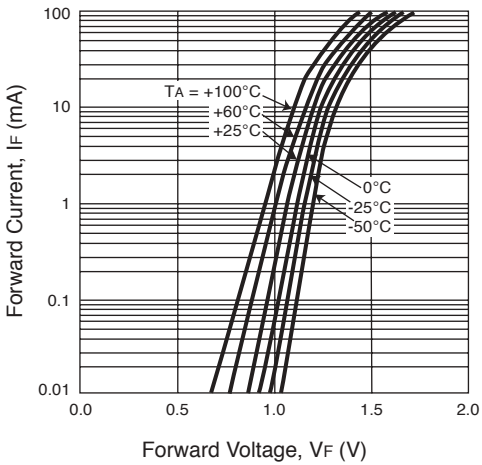
MAXIMUM FORWARD CURRENT vs. AMBIENT TEMPERATURE



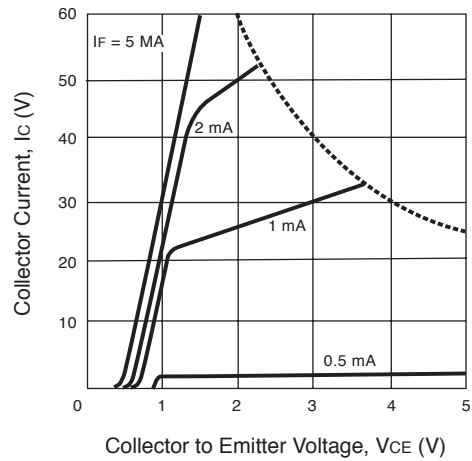
TRANSISTOR POWER DISSIPATION vs. AMBIENT TEMPERATURE



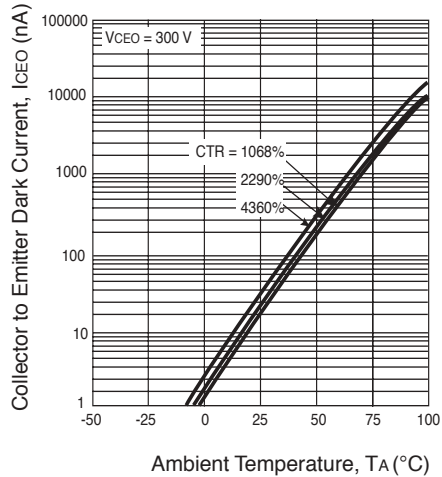
FORWARD CURRENT vs. FORWARD VOLTAGE



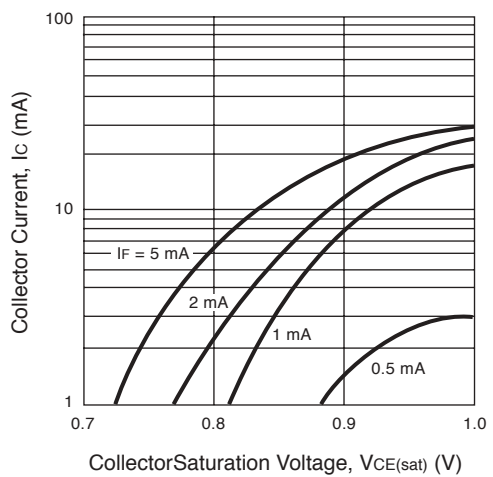
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER DARK CURRENT vs. AMBIENT TEMPERATURE

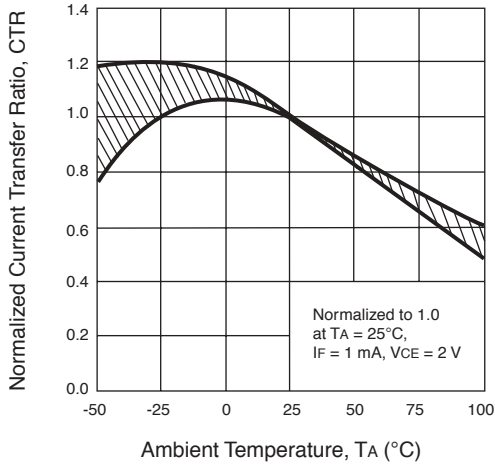


COLLECTOR CURRENT vs. COLLECTOR SATURATION VOLTAGE

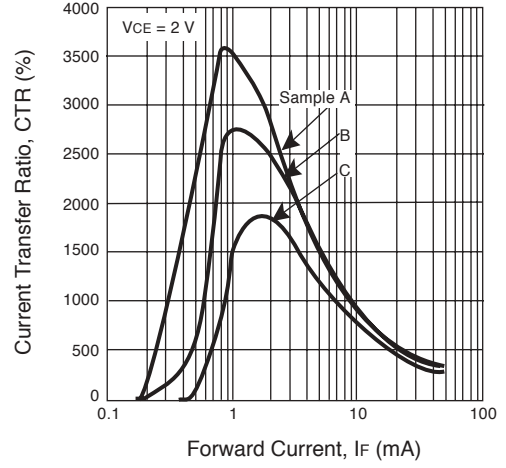


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

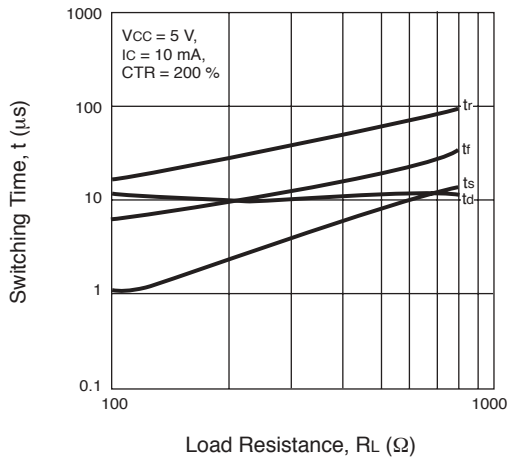
NORMALIZED CURRENT TRANSFER RATIO vs. AMBIENT TEMPERATURE



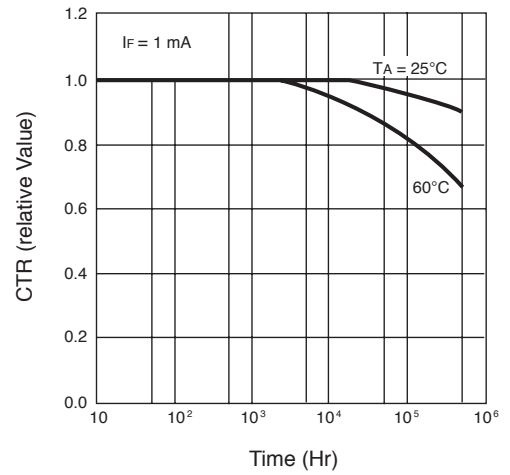
CURRENT TRANSFER RATIO vs. FORWARD CURRENT



SWITCHING TIME vs. LOAD RESISTANCE



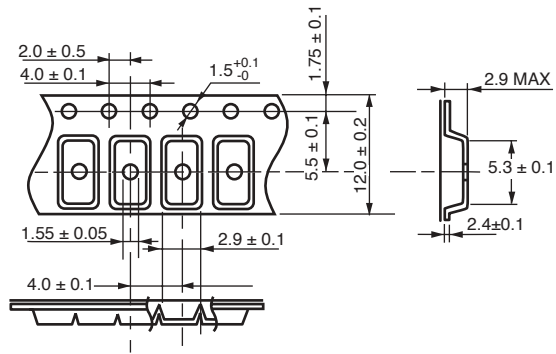
LONG TERM CTR DEGRADATION



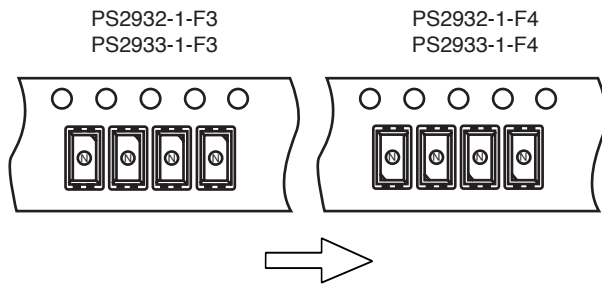
REMARK: The graphs indicate nominal characteristics.

TAPING SPECIFICATIONS (Units in mm)

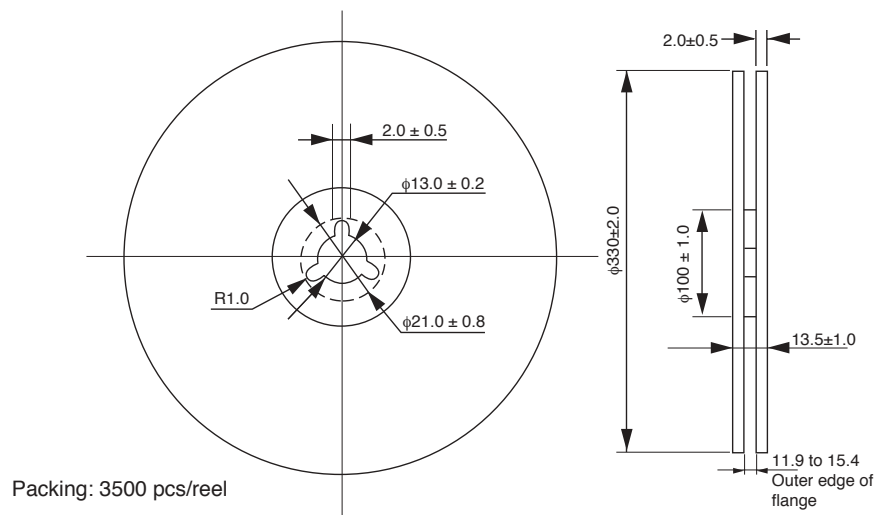
Tape Outline and Dimensions



Tape Direction



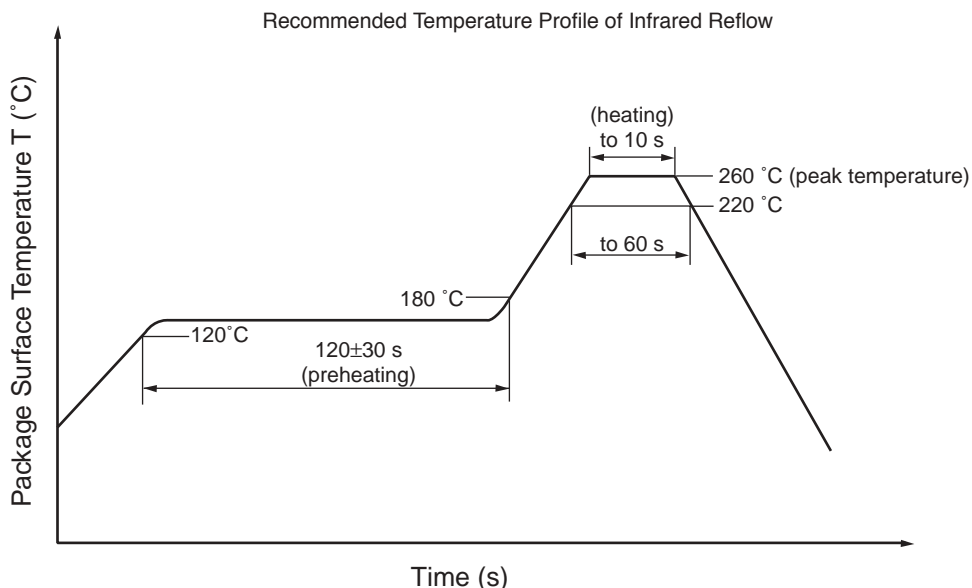
Reel Outline and Dimensions



RECOMMENDED SOLDERING CONDITIONS

(1) Infrared reflow soldering

- Peak reflow temperature 260 °C or below (package surface temperature)
- Time of peak reflow temperature 10 seconds or less
- Time of temperature higher than 220 °C 60 seconds or less
- Time to preheat temperature from 120 to 180°C 120±30 s
- Number of reflows Three
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended).



(2) Wave soldering

- Temperature 260 °C or below (molten solder temperature)
- Time 10 seconds or less
- Preheating conditions 120°C or below (package surface temperature)
- Number of times One (Allowed to be dipped in solder including plastic mold portion.)
- Flux Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt % is recommended).

(3) Cautions

- Fluxes Avoid removing the residual flux with chlorine-based cleaning solvent after a reflow process.

USAGE CAUTIONS

1. Protect against static electricity when handling.
2. Avoid storage at a high temperature and high humidity.

Life Support Applications

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02/06/2002